

REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 1-7 are in the case.

Rejection of Claims 1-7 under 35 USC 103(a)

The Examiner maintained the rejection of Claims 1-7 under 35 USC 103(a) as being unpatentable over Berghofer et al (US 5,211,400 B1) in combination with Applicants' own disclosure. The Examiner stated at page 3 first full sentence: "It is tenable that the sulfinic acid derivatives (reducing agents) used in the emulsion polymerization technique of Berghofer et al would generate a final polymer emulsion governed by a reduction in formaldehyde since the vinyl acetate based polymer emulsion of Berghofer et al, as modified, is essentially the same as the claimed vinyl acetate based polymer emulsion and there is nothing iron clad on this record diffusing this issue." The Examiner is requested to clarify "as modified" in the above statement. If the phrase means that the polymer of this invention is essentially the same as the polymers disclosed by Berghofer et al., Applicants strongly disagree. Use of a crosslinking monomer, such as NMA, produces a distinctly different polymer than the polymers disclosed by Berghofer et al.

Also, the Examiner equated "do not eliminate formaldehyde" (col. 4, line 23) with "a reduction in formaldehyde." Applicants strongly disagree with this interpretation. "Do not eliminate" means just what it says; formaldehyde is not eliminated. There is no mention of reduction of formaldehyde, because there is no recognition that it will serve to reduce formaldehyde. There is no recognition that it will serve to reduce the formaldehyde because there is no teaching of polymerization in which NMA, which contains formaldehyde, is a monomer.

As the Examiner indicated, the reference is evaluated, as a whole, for what it fairly teaches. It teaches, as a whole, that the novel compounds disclosed therein can be used as reducing agents and will not eliminate formaldehyde before, during and after use. Berghofer et al make no mention of polymerization in which residual formaldehyde is formed.

As stated in the response to the previous office action:

At page 1, lines 12-14, of the instant specification, it states:

"Reduction of formaldehyde in vinyl acetate based emulsions has been achieved by using less favored reducing agents to the formaldehyde sulfoxylates, or by reducing the level of N-methylol acrylamide. ..."

The ability to use NMA in the polymer and still reduce the amount of formaldehyde in the resulting emulsion polymer is the value of the reducing agents of this invention. The formaldehyde-free reducing agent of this invention unexpectedly reduces the amount of formaldehyde in the final polymer emulsion product, compared to other formaldehyde-free reducing agents. See Example 2 of this specification in which polymers of vinyl acetate, ethylene, and NMA were produced using either ascorbic acid (sodium erythorbate) or Bruggolite FF 6 as reducing agent. Use of sodium erythorbate resulted in no additional formaldehyde being formed during the polymerization process. However, unexpectedly, use of Bruggolite FF 6, in the same process, resulted in a reduction of formaldehyde. A summary of the 3 different runs reported in Example 2 is presented below:

Amount of Formaldehyde (ppm) using One of the following Reducing Agents:		
Vinyl Acetate-Ethylene-NMA Polymer	Sodium Erythorbate	Bruggolite FF 6
A (Tg = -14 °C)	27.2	3.3
B (Tg = 10 °C)	57.1	8.6
C (Tg = 0 °C)	47.5	6.8

The above described reduction in formaldehyde is not reported by Berghofer et al. In fact, Berghofer et al state, at col. 4, lines 22-24, that the compounds disclosed therein have a reducing action comparable to formaldehyde sulfoxylate; but they do not eliminate formaldehyde before, during, or after use. It does not disclose or suggest use of NMA, a monomer that contains free formaldehyde, as a co-monomer for preparation of polymers using sulphuric acid derivatives as reducing agents.

The above data rebut a *prima facie* obviousness rejection based on Berghofer et al together with what is well known and admitted in the Background of this Invention. Based on these data it would not have been obvious to use one of the reducing agents of this invention, such as Bruggolite FF 6 (a glycolic acid adduct of sodium sulfite), in place of

sodium erythorbate (another formaldehyde-free reducing agent) and obtain a vinyl acetate-ethylene-NMA polymer emulsion containing a smaller amount of formaldehyde.

It is therefore submitted that the claimed invention would not have been obvious based on Berghofer et al together with what is well known and admitted in the Background of this Invention. Berghofer et al do not teach preparation of polymers containing NMA, and do not teach or suggest that formaldehyde would be lowered during the preparation of polymer emulsions in which reducing agents described therein were used. In addition, the data in this case rebut a *prima facie* obviousness rejection based on Berghofer et al together with what is well known and admitted in the Background of this Invention.

Withdrawal of all rejection is requested.

Respectfully submitted,



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